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## Meat and meat products — Determination of nitrite and nitrate content — Ion chromatography method

*Viandes et produits carnés — Détermination des teneurs en nitrites et  
nitrates — Méthode de chromatographie ionique*

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## Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 6, *Meat, poultry, fish, eggs and their products*.

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# Meat and meat products — Determination of nitrite and nitrate content — Ion chromatography method

## 1 Scope

This document specifies a method for the determination of nitrite and nitrate in meat and meat products using ion chromatography.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

## 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

## 4 Principle

Samples are extracted in water with interferences of protein and other substances removed by the addition of protein precipitators and purification columns. The analytes are separated by anion-exchange chromatography. Detection is performed using conductivity or UV/VIS detection with an external standard method.

## 5 Sampling

Sampling is not part of the method specified in this document. A recommended sampling method is given in CAC/GL 50-2004.

It is important that the laboratory-received sample is truly representative and has not been damaged or changed during transport or storage.

Start from a representative sample of at least 200 g. Store the sample in such a way that deterioration and change in composition are prevented.

## 6 Preparation of test sample

Homogenize the laboratory sample with the appropriate equipment (7.2). Take care that the temperature of the sample does not exceed 25 °C. If a mincer is used, pass the sample at least twice through the equipment.

Fill a suitable airtight container with the prepared sample. Close the container and store it in such a way that prevents deterioration and change in composition. Analyse the sample as soon as possible, but always within 24 h after homogenization.

## 7 Test method of Ion chromatography

### 7.1 Reagents and Materials

Only reagents of recognized analytical grade and only water of at least grade 1 purity as defined in ISO 3696 shall be used.

**7.1.1 Potassium ferrocyanide (106 g/L)**, Weigh 106 g of potassium ferrocyanide, dissolve with water, dilute to 1 000 mL, and mix well.

**7.1.2 Zinc sulphate (220 g/L)**, Weigh 220 g of zinc sulfate, dissolve with water, dilute to 1 000 mL, and mix well.

**7.1.3 Potassium hydroxide (1 mol/L)**, weigh 5,6 g of potassium hydroxide, dissolve with water, dilute to 100 mL, and mix well.

**7.1.4 Sodium nitrite (NaNO<sub>2</sub>, CAS No.<sup>®</sup>1: 7632-00-0)**, standard reagent, alternatively, sodium nitrite standard solution with reference material certificate, may be used.

**7.1.5 Sodium nitrate (NaNO<sub>3</sub>, CAS No.<sup>®</sup>: 7631-99-4)**, standard reagent, alternatively, sodium nitrate standard solution with reference material certificate, may be used.

**7.1.6 Nitrite standard stock solution (100 mg/L, as NO<sub>2</sub><sup>-</sup>, the same herein below)**, accurately weigh 0,150 g of sodium nitrite which has been dried to constant weight at 104 °C ± 3 °C, dissolve with water and transfer into a 1 000-mL volumetric flask, adjust to 1 000 mL with water, and mix well. The stock solution may be used for a maximum of 2 weeks if stored in a refrigerator at 4 °C.

**7.1.7 Nitrate standard stock solution (1 000 mg/L, as NO<sub>3</sub><sup>-</sup>, the same herein below)**, accurately weigh 1,371 g of sodium nitrate which has been dried to constant weight at 104 °C ± 3 °C, dissolve with water and transfer into a 1 000-mL volumetric flask, adjust to 1 000 mL with water, and mix well. The stock solution may be used for a maximum of 2 weeks if stored in a refrigerator at 4 °C.

**7.1.8 Sodium nitrate and sodium nitrite mixed standard intermediate solution**, accurately pipette 1,0 mL of nitrite ion (NO<sub>2</sub><sup>-</sup>) standard solution and nitrate ion standard solution (NO<sub>3</sub><sup>-</sup>) respectively into a 100-mL volumetric flask, and adjust to 100 mL with water. Each 1 L of the obtained solution contains 1,0 mg of nitrite ion and 10,0 mg of nitrate ion. It is recommended to prepare the standard solutions on the day of use.

**7.1.9 Sodium nitrate and sodium nitrite mixed standard working solutions**, pipette sodium nitrate and sodium nitrite mixed standard intermediate solution, serially dilute with water to prepare a set of mixed standard working solutions with the recommended nitrite ion concentration of 0,02 mg/L, 0,04 mg/L, 0,06 mg/L, 0,08 mg/L, 0,10 mg/L, 0,15 mg/L, 0,20 mg/L and nitrate ion concentration of 0,2 mg/L, 0,4 mg/L, 0,6 mg/L, 0,8 mg/L, 1,0 mg/L, 1,5 mg/L and 2,0 mg/L. It is recommended to prepare the standard solutions on the day of use.

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